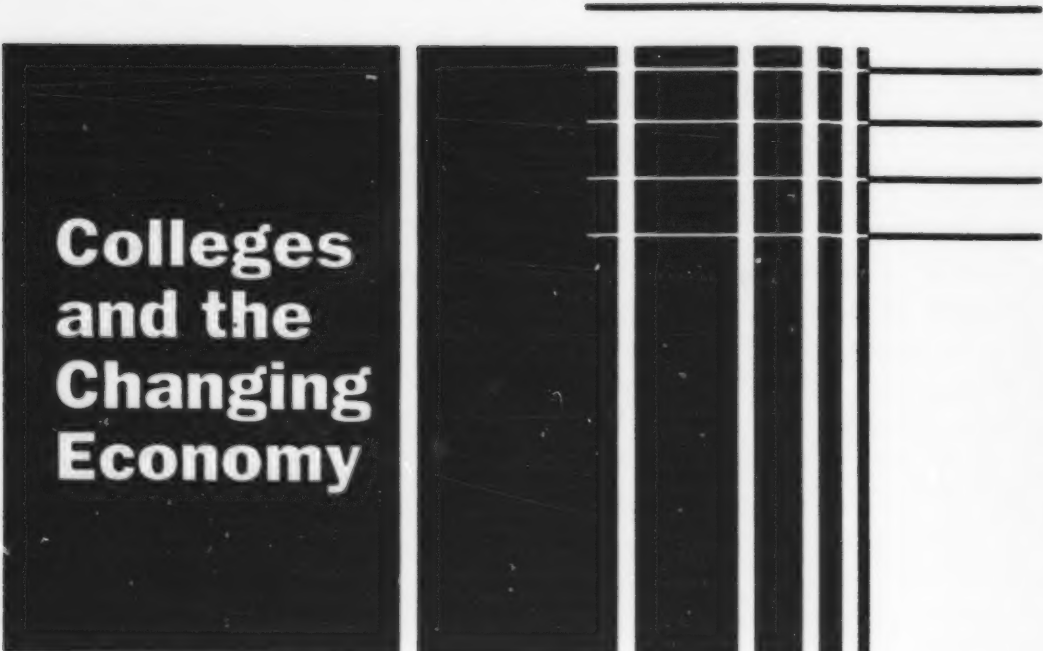




Colleges and the Changing Economy

Study Team 2 Final Report

 **VISION
2000**

Vision 2000 is a review of the mandate of Ontario's Colleges of Applied Arts and Technology. It is coordinated by the Ontario Council of Regents and was initiated by the Minister of Colleges and Universities in October of 1988.

A Steering Committee, with broad-based representation, was established to guide the Vision 2000 process. Consultation, with a wide variety of stakeholders, and research was handled by five study teams. Study Team 1's task was to provide an empirical snapshot of the current college system and its external environment. Study Team 2 examined the role of colleges in our changing economy, while Study Team 3 looked into ways that the college system could promote access and educational support for diverse learners. Study Team 4's purpose was to study the challenging interrelationships of quality, accessibility and efficiency. For Study Team 5 the research and consultation focussed on the linkages between colleges and other educational institutions.

The Final Report of Study Team 2 is the outcome of the deliberations of the members of Study Team 2, Chaired by Lorna Marsden. This Final Report does not necessarily represent the views of the Vision 2000 Steering Committee, the Ontario Council of Regents, or the Government of Ontario.

The members of the Study Team wish to thank the Vision 2000 secretariat and the Council of Regents staff, particularly Michele Nugent and Barb Lidston, for their tireless contribution to the process.

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Study Team members participated in Vision 2000 as individuals. There is no implied or necessary connection between the opinions expressed in this Final Report and the positions or policies adopted by the organizations with which Study Team members are affiliated or employed.

Introduction:

▲ Objectives and Methodology

Study Team 2's objective was to define the economic role of Ontario's CAATs for the future and to propose policy options which will enable the college system to fulfill that role. The Team members, chosen from a broad range of business, labour, academic and community constituencies, acted as the primary resource for realizing this objective. Supplementary insights were added to the Team's expertise by commissioning five research papers and engaging in an extensive round of consultations.

Our research and consultations confirmed and extended our understanding of the link between education and the economy. More than ever the colleges economic role is deemed to be a critical component of Ontario's efforts to plan for a fair, equitable and prosperous future.

Taking a cue from many sources, including the Premier's Council On Technology, the Team's workplan set out to examine future training requirements, the impact of technological change, the desire for labour market flexibility, and changes in the composition of the labour force. We gathered information about the role of 'community colleges' in a range of areas, from vocational training to the diffusion of new technologies.

The Study Team discovered that there is a general renewal of interest in education. All sectors of Ontario society, from large manufacturing firms to local community groups in Northern Ontario, are convinced that education is either the best or one of the most important ways to improve our standard of living.

Although we did not expect to find general agreement concerning the content and methods for delivering education, we did discover the extent and range of issues where there was unanimity. Overall, both our research and consultations reveal a consensus that public education delivered by the colleges must emphasize the provision of 'generic skills' to a broader, more differentiated and demanding student population. (See the next three sections for detailed definitions and recommendations.)

Naturally, there is controversy surrounding the extent to which economic and educational objectives can be integrated. However, Study Team 2 has discovered

considerable common ground amongst a very wide range of constituencies. This common ground has emerged in large part because of the unprecedented nature and scope of the social and economic changes taking place in Ontario. Our definition and delivery of 'vocational training' is changing as occupational structures, career patterns, and individual needs all change simultaneously and significantly.

By combining the knowledge of labour, business people, college educators, and researchers, Study Team 2 was able to develop an agenda which reflected the economic needs and aspirations of Ontarians. For instance, our consultations helped to formulate a working definition of the educational goals of the college system based upon the needs of students, employers, workers, educators, and community groups. The Team has endeavoured to take the interests of workers in employability and job security, and of employers in productivity, as one of the cornerstones of Ontario's college system. In the end, there was a very broad based consensus regarding most issues and recommendations. However, it is important to note that on a number of items minority opinions were expressed and that this report does not reflect total unanimity on all items.

▲ Purpose and structure of this report

The central goal of this Final Report is to assist the Steering Committee to produce a report which the Council of Regents will be able to forward to the Minister of Colleges and Universities. It is also our hope that these recommendations will help the colleges to serve the needs of the public into the next century. With these objectives in mind, the document is divided into six sections. Section 1 presents a series of challenges facing Ontario society. Section 2 offers a set of general strategic choices which address the potential role of Ontario's colleges. Section 3 then provides a series of more specific policy recommendations pertaining to the colleges and the avenues for responding to the challenges along particular strategic lines. All three sections are the outcome of the Team's research, consultation and deliberation. Sections 4 and 5 summarize the results of the Team's research and consultations and offer the reader a guide to the documentation which provides the in-depth reasoning behind the policy conclusions. (Interested readers can request any of the background papers by writing the Ontario Council of Regents.) In the final section, we offer recommendations which go beyond the termination of Vision 2000 with suggestions for further action.

▲ **Overview of Challenges, Strategic Choices and Policy Recommendations**

The next 5 pages summarize, in schematic form, the major themes of this final report. Not all of the recommendations are listed in the summary tables, for a full set see Section 3.

Challenges	Realizing the fruits of technological, economic and social change in an era characterized by greater global interdependence. With the entry of the 'baby boom' generation into the workforce starting in the late 1960s Ontario's colleges took on the task of training young people for an economy dominated by manufacturing, a relatively stable technological base, and careers of almost a lifetime's duration. Today the traditional educational cohort is experiencing a 'baby bust' while the needs of those already in the labour force for some time are expanding rapidly. All workers face significant and on-going changes in the sectoral, technological, and occupational character of the economy. The Premier's Council has articulated the challenge clearly: "Developing a strong dynamic human resource base is a precondition to sustained economic growth....One of the key competitive challenges Ontario faces is developing our most fundamental resource: the minds and skills of our workers." (<u>Competing in the New Global Economy, Report of the Premier's Council of Ontario</u>, Volume I, p. 215, 1988) Ontario's colleges are positioned to meet this challenge. For workers and employers the colleges are an accessible resource which needs to be effectively integrated into the overall public response to the economic and social challenges facing Ontario. Rooted in the community with a tradition of local responsiveness, the colleges are now ready to build upon the structures of local responsibility and reach out to form a coordinated network. With enhanced collective capabilities the colleges will be able to span the diverse needs of students and society as a whole for a wider and deeper range of skills.
Strategic Responses	Pro-active college education policy as an economic and social force. In the context of rapid and global social, technological and economic change, Study Team 2 believes that a pro-active college education policy, which includes broad based cooperation with labour, business, community organizations and the public sector, will contribute significantly to the realization of a high value-added economy, a flexible workforce, economic revitalization, equity and social well-being.
Selected Policy Recommendations*	▲ 1: Recommend that in the context of the Premier's Council's efforts, the Ontario Government explicitly include the college system as an active participant in the effort to pursue a high wage, high productivity economic strategy. ▲ 2: In the context of province-wide undertakings such as the strategies being initiated by the Premier's Council and the calls by many clients of the colleges for academic standards and credit transferability, it is time for a significant increase in collaboration and coordination amongst all 23 colleges. Therefore, Study Team 2 recommends that the colleges establish a collective mechanism, with a fully representational structure, which will be capable of developing, articulating, and implementing a provincial role - as an economic and social partner - for the college system as a whole. (For more detail see Section 3). ▲ 3: Recommend that the Ontario Government recognize and promote the role of college education in an economic strategy which aims to avoid income polarization by engaging in occupational and educational upgrading across all sectors of the economy. By providing skill upgrading and education applicable to all sectors of the economy, colleges can play an important part in avoiding a situation where the workforce is polarized on the basis of income and skill levels. Government policy should recognize the importance of skill upgrading both within sectors and across sectors as a crucial part of a strategy to actively promote equality and a dynamic, flexible economy.

* For a more detailed presentation of all the recommendations, please see Section 3.

Overview of Challenges, Strategic Choices and Policy Recommendations

Challenges	Meeting the educational needs of tomorrow's workplace and society. Charged with the task of equipping students with the knowledge needed for Ontario's evolving economy and society, one of the central challenges for the colleges is to ascertain what skills are needed. For the colleges the verdict is clear. The challenge is to provide education which gives workers the portable and expandable skill base needed to ensure security of employment/ employability and the capacity to shift between jobs with different skill requirements. To satisfy employers, colleges must offer education which allows workers to adapt rapidly to changing technology, monitor quality, and improve the production process. Hence the call for colleges to focus on 'generic skills' which serve the needs of students, employers and society at large.
Strategic Responses	Setting the primary educational goal of the colleges. In order to serve the needs of all Ontarians, from young high school graduates and immigrants with diverse credentials to the unemployed and adult learners, colleges should aim to enhance the basic ability of each individual to acquire information, reason clearly, think critically, communicate ideas effectively, embrace the "entrepreneurial spirit" of putting ideas into practice, and be an informed citizen. Meeting this objective must include a significant proportion of general education and generic skills which are required in order to prepare Ontarians for a productive economy and a changing society.
Selected Policy Recommendations*	▲ 4: Recommend that the Ontario Government set the mandate of the college system so as to ensure that the <i>primary</i> goal is to provide 'generic education' for all students regardless of type or duration of program. A basic definition of generic education encompass the following components: "... practical life skills essential for both personal and career success ... including language and communications skills, math skills, learning and thinking skills, interpersonal skills, and basic technological literacy. They are not job specific, but are crucial to mastering changing technologies, changing environments and changing jobs. Some generic skills are now taught in discrete courses - communication, mathematics, creativity - while others - critical thinking, problem solving, logic, technological literacy - may be introduced and/or reinforced in courses across the curriculum." (Park) The intent is to ensure that skills training educates students beyond the narrowly defined needs of a particular job and leaves the trainee better able to take on different tasks in the future. This should be the case whether the program lasts two hours or two years.

* For a more detailed presentation of all the recommendations, please see Section 3.

Challenges	Actively encouraging lifelong learning. For years many constituencies, from educators and businesses to community groups and government ministries, have been aspiring to create a 'training culture' and introduce lifelong learning; yet we have failed to ensure a system where educational attainment (formal or informal) is fully valued or where one credential leads easily and fairly to another. As a result students are faced with many barriers which inhibit their investment in further study and often reduce the value of the credentials they work so hard to acquire. The challenge for Ontario's colleges is to overcome these barriers to responsiveness by breaking down the institutional boundaries and democratizing the educational system to ensure effective cooperation and grass roots input. With a growing demand for education in all aspects of life the colleges must be able to respond efficiently and equitably across a range of needs. One of the challenges is to balance the demands of local employers and the public at large for short-duration skill-specific training with the broader public responsibility of the colleges to impart the generic and portable knowledge which is needed for the long-run competitiveness of the economy and social well being. Colleges will need to address this wide range of demands through institutional and educational innovation.
Strategic Responses	Developing an integrated educational spectrum. Study Team 2's research and consultation have revealed that a range of policy initiatives are needed in order to overcome the excessively high costs, to students and other clients of the colleges, that are imposed by the lack of overall academic consistency, flexibility and transferability between academic programs and institutions throughout Ontario's educational spectrum. For the colleges the solutions involve reducing the information and other costs associated with inter-institutional cooperation so as to facilitate credit transfers, improve academic quality, and actively encourage lifelong learning. The time has come to introduce a network which will coordinate resources more effectively and allow for greater collaboration and collective decision making with all of the various stakeholders.
Selected Policy Recommendations*	▲ 7: In light of the need for major increases in the scope and scale of lifelong learning, it is time for the colleges and the educational system in general to facilitate further initiatives in areas such as credit banking, flexible and efficient methods for establishing credentials, inter- and intra- institutional transferability, and academic consistency. Beginning from the premise of respecting the integrity of all educational institutions, including all 23 colleges, Study Team 2 considers that it is time for the colleges to become a college system for the purposes of planning, assessment and academic credibility. ▲ 8: In order to realize the advantages of system-wide academic standards the Ontario Government should direct the colleges to establish a framework for accountable system-wide academic self-governance by establishing a representative body composed of the college academic staff, college administrations, trade unions, employers, community representatives, and the relevant government ministries responsible for education and labour markets.

* For a more detailed presentation of all the recommendations, please see Section 3.

Challenges	The on-going challenge of realizing Ontario's social and economic goals simultaneously. Colleges have a crucial role to play in the mutually-reinforcing achievement of both social equity and economic efficiency. In the context of both qualitative and quantitative demographic change there is a powerful convergence of economic need and equity imperatives. The colleges are an important mechanism for linking the highly diverse skills, culture, language, and aspirations of Ontario's population to an equally complex and demanding work world. A related challenge confronting Ontario's colleges is to assist with public policy efforts to enhance the functioning of the labour market and move closer to full employment. Specifically, colleges have a role to play in overcoming the mismatch between the growing number of para-professional jobs and the skill profiles of the currently available workforce. The degree of mismatch and consequent need for more effective public policy is even more serious when considering disadvantaged, unemployed and immigrant workers. Consequently, the colleges must accept the task of reaching out to adult and disadvantaged learners in order to impart the generic skills which our economy and society require.
Strategic Responses	Realizing greater social equity and economic efficiency. Given the extent of qualitative and quantitative demographic change taking place in Ontario, colleges will need to play a major role in realizing the mutually reinforcing aspects of social equity and economic efficiency. Colleges are well placed to encompass both objectives by providing one of the major links between the diverse skills, culture and aspirations of Ontario's population and the equally complex and demanding world of work. This linkage can only be realized if colleges are learner centred in a way which improves the effectiveness of the educational process, as measured by retention rates and academic standards, for a very diverse set of clients. Colleges must continue to be educational innovators in order to take into account each student's unique cultural background, job history, and future prospects.
Selected Policy Recommendations*	▲ 10: The simultaneous need to improve academic quality and expand access with success for a more diverse and demanding student body means that the colleges need to introduce a wide variety of customized preparatory strategies founded upon consistent and effective evaluation mechanisms. Therefore, in the interests of access and academic standards, it is time for the Ontario Government to provide direct encouragement for the introduction of a universal and coordinated approach to preparatory and remedial education in the colleges. ▲ 12: In order to facilitate the process of entry, transfer, and cooperation amongst educational institutions in a way which reduces information costs for students and employers the college system must establish consistent academic standards. These standards should respect the specific needs of local communities and the integrity of the curriculum development as a participatory process led by the academic staff.

* For a more detailed presentation of all the recommendations, please see Section 3.

Challenges	Working within budgetary constraints while meeting growing needs. In a world of finite resources, colleges already represent a significant collective and individual investment in education. Some of this investment can be accounted for in terms of the dollars spent, but a large share consists of the commitments made by teachers, students, administrators and support staff. Our aim must be to respect and value this investment by striving to serve student demands for accessible high quality education. To meet this dual demand for access and academic excellence within reasonable fiscal limits will require changes in the way we manage our educational investments. Taking on the challenge of managing Ontario's educational system, and the colleges in particular, in new and innovative ways implies a need to consider changes to the current institutional framework. Other Vision 2000 Study Teams have looked directly at the issue of institutional change within the college system (Study Team 4) and the need for changes in the nature of the linkages between schools, colleges and universities (Study Team 5). For Study Team 2 the economic vantage point raises the question of involvement by employers, labour, and the community in a provincial process for realizing academic standards and transferability. Here the challenge for the colleges and college system is to find mechanisms which will both gain the insights and find a balance between the interests of different stakeholders.
Strategic Responses	Delivering education with finite resources. Realizing the combined objectives of customized access and academic excellence within reasonable fiscal limits will mean that colleges, like business, labour and government, must work to increase organizational effectiveness. The colleges as a whole will need to take advantage of the information age, advancements in participatory managerial practice, and representative structures which incorporate the insights and needs of a diverse group of stakeholders. By using the strengths of a networked structure, which allows for more developed coordination than is currently the case, the college system will be able to realize academic excellence and efficiency in ways which enhances decentralized access to advanced skills, teaching methods, and credentials.
Selected Policy Recommendations*	▲ 23: Recommend that the college system attempt to reduce unwarranted duplication, provide mechanisms for enhanced accessibility to a wider range of courses, credentials and programs within a framework that streamlines managerial hierarchies, introduces system-wide integrated information systems, fosters academic specialization where there is a clear local and/or provincial need, and aims to provide flexible, low overhead education. ▲ 5: Recommend that "the Ontario Government establish an Office of Applied Research within the Ontario college system. This office would have a number of tasks, including the development of a registry of faculty and staff willing and qualified to carry out research, establishment of an information and assistance program for faculty and staff wishing to gain access to funding for research, administration of a research fund to support a small program of grants for faculty and staff, seeking partners from the business, labour, government and non-profit sectors for collaboration in college-based research activities and development of an applied research agenda for the entire college system." (Borins and Holloway) This proposal is intended to enhance the primary function of the colleges, which is teaching, and does not overlap with the kinds of research properly carried out within the university setting. The main aims of this recommendation are to improve morale and job satisfaction within the colleges and ultimately increase the quality and relevance of instruction at the colleges as well as contribute to socio-economic innovation and technology diffusion in the college's community and region. ▲ 6: Recommend that the Ontario Government establish an Institute for Innovation in Educational Software as a joint venture between the colleges, the software industry, and all of the relevant government ministries. (For more detail see Section 3).

* For a more detailed presentation of all the recommendations, please see Section 3.

▲ Definition of Terms and Issues

College system or system of colleges?

Since the inception of the Colleges of Applied Arts and Technology the question has been posed as follows: is it a system of colleges or a college system? This dualism counterposes autonomy to centralization. The issue today is more accurately that of cooperation and coordination for the mutual benefit of students and local colleges. In this context it is important to avoid setting up simplistic and irreconcilable choices between centralized authority and local autonomy. More usefully, the issue is how to provide each local college with the additional resources and choices available through system-wide decision making around such issues as: academic standards, credit transfers, student assessment methods, fee for service training, human resource development initiatives, applied research services, and articulation with other components of the educational spectrum. The goal is to respect and enhance the integrity, effectiveness, and accountability of the colleges as learner and community responsive institutions within a provincial framework.

Customized access:

This concept refers to the need for individual treatment of incoming students through assessment and personalized tailoring of preparatory courses, program design and delivery, and general counselling. Specific teaching methods, from collective to personalized, should suit the student's needs. The goal is to facilitate access for a very diverse student population while also ensuring that students succeed in completing academically rigorous programs. The aim is to realize 'access with success.' Study Team 4 has dealt with this issue in greater depth. (See Terry Dance, "Access and Quality: Preparatory and Remedial Education in the Colleges," Study Team 4.)

General education:

"A crucial distinction between general education courses and generic skills courses as now constructed lies in the realm of content. A skills course places its primary emphasis on 'how to' ... how to write essays, how to solve calculus problems, how to find information in a library. For the most part, content is secondary, an adjunct to or practice prop for the development and refinement of a particular skill. True college-level general education courses, on the other hand, place their primary emphasis on content. In retrieving, talking and writing about that content, in shaping, analyzing and evaluating it, students are also required to develop and refine high level generic skills, an inherent by-product of such general education." (Michael Park)

Generic skills:

"Generic skills are practical life skills essential for both personal and career success. They include language and communications skills, math skills, learning and thinking skills, interpersonal skills, and basic technological literacy. They are not job specific, but are crucial to mastering changing technologies, changing environments and changing jobs. Some generic skills are now taught in discrete courses - communication, mathematics, creativity - while others - critical thinking, problem solving, logic, technological literacy - may be introduced and/or reinforced in courses across the curriculum. Facility in some generic skills - reading, listening, writing, learning - is a prerequisite for success in most college-level courses." (Michael Park, "Expanding the Core: General Education, Generic Skills and Core Curriculum in Ontario Community Colleges," Study Team 4.)

Polarization and equity:

The research and consultations raised a series of issues related to the polarization of income, skills and life chances. In large measure, the question is whether trends are towards greater or lesser degrees of inequality. Are the changes taking place in the occupational definitions and structure of our economy forcing a growing number of people into the extreme ends of the wage and skill spectrum? Are we moving towards a society of haves versus have nots? Although definitive conclusions regarding the empirical dimensions of this problem are suggested in the research, the consensus regarding the colleges pertains to the positive role for education in avoiding such polarization. Colleges provide an educational means for the diffusion of higher skills and occupational equity. By playing a catalytic role colleges can supply a workforce where the initial structure of earned income is less polarized.

Section 1: Challenges

▲ 1: Realizing the fruits of technological, economic and social change in an era characterized by greater global interdependence

It has become increasingly obvious that governments throughout the world must rethink their economic policies in order to compete successfully in the new global economy because the rapid development of information and communications technology has transformed the marketplace. The key factors in a successful economy are the abilities to develop new technology and to apply it to create new products and processes. This requires a high level of research and development, a literate, well-educated workforce and increasing cooperative initiatives between government, business and labour. (Borins and Holloway)

With the entry of the 'baby boom' generation into the workforce starting in the late 1960s Ontario's colleges took on the task of training young people for an economy dominated by manufacturing, a relatively stable technological base, and careers of almost a lifetime's duration. Today the traditional educational cohort is experiencing a 'baby bust' while the needs of those already in the labour force for some time are expanding rapidly. All workers face significant and on-going changes in the sectoral, technological, and occupational character of the economy. Job content and occupant are now changing repeatedly.

Simply adapting to change will not be enough. Neither firms nor individuals, much less a government in which the public has put its trust, can wait to respond. Initiative offers the prospect of making change a building block instead of a stumbling block. In the 1990s government won't be expected to take the initiative alone. Instead the public sector will be called upon to enable all members of society to seize the opportunities offered by technological, economic, and social change. Cast in the role of facilitator in the information age, it is natural that governments around the globe are putting education into the public policy limelight.

The Premier's Council has articulated the challenge clearly:

Developing a strong dynamic human resource base is a precondition to sustained economic growth....One of the key competitive challenges Ontario faces is developing our most fundamental resource: the minds and skills of our workers. (Competing in the New Global Economy, Report of the Premier's Council of Ontario, Volume I, p. 215, 1988.)

Ontario's colleges are positioned to meet this challenge. For workers and employers the colleges are an accessible resource which needs to be effectively integrated into the overall public response to the economic and social challenges facing Ontario. Rooted in the community with a tradition of local responsiveness, the colleges are now ready to build upon the structures of local responsibility and reach out to form a coordinated network. With enhanced collective capabilities the colleges will be able to span the diverse needs of students and society as a whole for a wider and deeper range of skills.

▲ 2: Meeting the educational needs of tomorrow's workplace and society

Charged with the task of equipping students with the knowledge needed for Ontario's evolving economy and society, one of the central challenges for the colleges is to ascertain what skills are needed. Study Team 2 devoted considerable time and effort to exploring the dimensions of the educational services employers, employees, and researchers believe colleges should deliver. One of the research papers summed up the college's educational goals as follows:

In light of the considerable uncertainty about future requirements for specific skills and the increasing importance of workplace centred learning, there is a growing consensus that the educational system should place greater emphasis on the transmission of fundamental skills. The concept of fundamental skills can be construed as having four dimensions:

- analytical problem solving skills;
- functional literacy;
- technological literacy; and
- interpersonal and communications skills.

The challenge for the colleges is to structure these components of fundamental skills into every aspect of their curriculum programming. The range of fundamental skills required by ... technologically literate workers ... cannot be taught as a discrete component of an increasingly specialized curriculum. Rather, they involve fundamental and generic skills that should form the basis of every other aspect of the curriculum. (Wolfe)

Another research paper captured the educational challenge confronting the colleges somewhat differently, it noted that:

... in addition to the 'three Rs,' the colleges need to provide an understanding of technology and its uses, including the potential social and human implications of technological change. Such a program nicely combines the two main aims of education: to enhance national economic performance ('efficiency') and to provide all citizens with the knowledge and confidence needed to participate fully in economic and community life ('equality'). It meets the objective of efficiency because a well educated workforce has the kind of 'polyvalent' skills not only to meet current workplace needs but also those of the future, in the service sector as well as in the goods-producing sector. It meets the objective of equality in that it counteracts the emergence of an 'hour-glass society,' where some enjoy stimulating, well-paid jobs while a large part of the population is confined to dead-end, low-wage jobs — with frequent spells on the unemployment rolls. (Mahon)

For the colleges the verdict is clear. The challenge is to provide education which gives workers the portable and expandable skill base needed to ensure security of employment/employability and the capacity to shift between jobs with different skill requirements. To satisfy employers, colleges must offer education which allows workers to adapt rapidly to changing technology, monitor quality, and improve the production process. Hence the call for colleges to focus on 'generic skills' which serve the needs of students, employers and society at large.

▲ 3: Actively encouraging lifelong learning

For years many constituencies, from educators and businesses to community groups and government ministries, have been aspiring to create a 'training culture' and introduce lifelong learning; yet we have failed to ensure a system where educational attainment (formal or informal) is fully valued or where one credential leads easily and fairly to another. As a result students are faced with many barriers which inhibit their investment in further study and often reduce the value of the credentials they work so hard to acquire. The challenge for Ontario's colleges is to overcome these barriers to responsiveness by breaking down the institutional boundaries and democratizing the educational system to ensure effective cooperation and grass roots input.

With a growing demand for education in all aspects of life the colleges must be able to respond efficiently and equitably across a range of needs. One of the challenges is

to balance the demands of local employers and the public at large for short-duration skill-specific training with the broader public responsibility of the colleges to impart the generic and portable knowledge which is needed for the long-run competitiveness of the economy and social well being. Colleges will need to address this wide range of demands through institutional and educational innovation. As one of the researchers explains, the challenge is to adopt and implement 'flexible learning.'

The term 'flexible learning' tends to be associated with the application of new technology to training delivery (e.g., distance learning) or with the introduction of 'training modules.' Both developments can contribute to enhancing the flexibility of the training system and enhanced flexibility is desirable if the current workforce is to become substantially involved in lifelong learning. In other words, the colleges will need to continue to experiment with new forms and methods of delivery if their programmes are to meet the needs of those currently in the workforce. Yet flexible learning should mean more than this:

Flexible learning should be seen as an educational philosophy which advocates an open flexible approach both to current developments and the delivery of programmes; that is, an approach which recognises the role of both teacher and student in deciding what and how to learn, and which also recognises the potential of technology to enhance the productivity of teachers and the quality of learning....In other words, flexible learning does not mean a fixation on form at the expense of content, or quantity at the expense of quality. (Mahon)

▲ 4: The on-going challenge of realizing Ontario's social and economic goals simultaneously.

Colleges have a crucial role to play in the mutually-reinforcing achievement of both social equity and economic efficiency. In the context of both qualitative and quantitative demographic change there is a powerful convergence of economic need and equity imperatives. The colleges are an important mechanism for linking the highly diverse skills, culture, language, and aspirations of Ontario's population to an equally complex and demanding work world. As explained in one of Study Team 2's research papers:

Equity and efficiency, then, can simultaneously be served if policies are adopted that encourage the expansion in the social services [public and private] in particular, while putting pressure on the producer and

consumer divisions to upgrade their workforce and thus to reduce the tendency to income polarization. The CAATs can make a contribution here via training and even research support. In all three divisions, the CAATs are particularly well placed to provide the para-professional skills required. (Mahon)

A related challenge confronting Ontario's colleges is to assist with public policy efforts to enhance the functioning of the labour market and move closer to full employment. Specifically, colleges have a role to play in overcoming the mismatch between the growing number of para-professional jobs and the skill profiles of the currently available workforce. The degree of mismatch and consequent need for more effective public policy is even more serious when considering disadvantaged, unemployed and immigrant workers. Consequently, the colleges must accept the task of reaching out to adult and disadvantaged learners in order to impart the generic skills which our economy and society require. As one of Study Team 2's research paper indicates:

The challenge then is to meet the anticipated demand for high-skilled, flexible workers who can fill a complex range of rapidly changing labour force jobs and volunteer and domestic tasks outside the formal economy. The needs for generic education and training and for a pervasive orientation to lifelong learning stem precisely from the fact that we cannot predict with any degree of certainty the exact future characteristics of these changing jobs and tasks. We can however state with some assurance that they will depend less and less on brute strength, and that employment equity factors will play an increasing role in filling them. We can work to make sure that this is the case. On the supply side, we know that we will have to rely increasingly on educating our existing pool of adults on a continuing basis. Persistently low fertility rates and low immigration rates of those bringing to Ontario the range of skills required will mean that we will be less and less able to rely on vast supplies of new workers to fill the demand for new skills. The economic challenge is to meet this demand.

The colleges are well-placed to contribute further to the achievement of increased access for all groups within the province and to provide people with basic education and skills. They are particularly attuned to the communities they serve and to the employment requirements of Ontario society. In order to ensure better access to college and more appropriate responses to community and province-wide needs, the colleges will however have to examine closely who now benefits and who in the future could benefit from college education. We cannot afford to waste the potentials of any Ontarians in the just and

prosperous Ontario that those in the colleges can help to shape.
(Armstrong and Armstrong)

It is also important to recognize that meeting this socio-economic challenge also implies working to enhance both the perceived and real status of the colleges and college graduates.

▲ 5: Working within budgetary constraints while meeting growing needs

In a world of finite resources, colleges already represent a significant collective and individual investment in education. Some of this investment can be accounted for in terms of the dollars spent, but a large share consists of the commitments made by teachers, students, administrators and support staff. Our aim must be to respect and value this investment by striving to serve student demands for accessible high quality education. To meet this dual demand for access and academic excellence within reasonable fiscal limits will require changes in the way we manage our educational investments.

This challenge was posed in a Study Team 2 research paper as follows:

Regardless of their specific vocation, or their educational background, each ... [element of the labour market] will share the need ... for more fundamental skills and greater technological literacy. The colleges must respond to [worker's] expanding educational needs in a flexible and creative manner. They will have to provide customized learning packages which address the diverse needs of their clients on both the demand (employer) and supply (student) sides of the labour market. In a sense the colleges will need to adopt the same principles for the flexible provision of education that constitutes the best practice frontier of management. The colleges will need to coordinate an increasingly heterogeneous system, but coordinate it in a way that enables strong system-wide sharing of development, standards and innovation, while simultaneously differentiating between the learning needs of various client groups. (Wolfe)

Taking on the challenge of managing Ontario's educational system, and the colleges in particular, in new and innovative ways implies a need to consider changes to the current institutional framework. Other Vision 2000 Study Teams have looked directly at the issue of institutional change within the college system (Study Team 4) and the need for changes in the nature of the linkages between schools, colleges and universities (Study Team 5). For Study Team 2 the economic vantage point raises

the question of involvement by employers, labour, and the community in a provincial process for realizing academic standards and transferability. Here the challenge for the colleges and college system is to find mechanisms which will both gain the insights and find a balance between the interests of different stakeholders.

Several of those consulted by Study Team Two have raised the issue of how to reconcile flexibility (and sensitivity to local needs) with quality control (and transferability) via the central imposition of standards. The literature on the current wave of technological and organisational change is suggestive of new ways to secure coordination without recourse to bureaucratic centralisation. This suggests the possibility of establishing a multipartite provincial body, with representation from employers, unions, community groups and the relevant ministries, complemented by local bodies with a similar composition. The provincial board could act as a coordinator and guarantor of basic standards and could develop the latter via a creative dialogue with the local boards. Such a structure would be aimed simultaneously at flexibility/responsiveness to local needs and quality/transferability.

If Vision 2000 sets its sights on the development of a community college system oriented to imparting technological literacy and the provision of flexible learning, it can make an important contribution to the province's development. Such a 'proactive' stance is not utopian. The wider debate on restructuring within Ontario and Canada as a whole constitutes a 'window of opportunity,' a chance to exercise real leadership in favour of equity and efficiency. (Mahon)

Section 2: Strategic Choices

Every policy process begins from a series of implicit and/or explicit premises. At the outset Study Team 2 considered a series of premises which we believed set the context for policy development. Subsequently, as we explored the issues in more depth it became clear that the current economic and social environment is marked by the major challenges outlined above. These challenges arise from the significant and far-reaching changes taking place in the world around us. Although Vision 2000 is concerned with the fate of the colleges in Ontario, Study Team 2 could not formulate policy responses to these challenges without taking into account the broader questions of socio-economic change.

The strategic directions outlined below situate the colleges in the broader educational, social and economic context. These strategic choices are intended to respond to the challenges outlined in Section 1 and provide a starting point for the specific programmatic and organizational recommendations found in Section 3.

▲ 1: Pro-active college education policy as an economic and social force

In the context of rapid and global social, technological and economic change, Study Team 2 believes that a pro-active college education policy, which includes broad based cooperation with labour, business, community organizations and the public sector, will contribute significantly to the realization of a high value-added economy, a flexible workforce, economic revitalization, equity and social well-being.

▲ 2: Setting the primary educational goal of the colleges

In order to serve the needs of all Ontarians, from young high school graduates and immigrants with diverse credentials to the unemployed and adult learners, colleges should aim to enhance the basic ability of each individual to acquire information, reason clearly, think critically, communicate ideas effectively, embrace the "entrepreneurial spirit" of putting ideas into practice, and be an informed citizen. Meeting this objective must include a significant proportion of general education and generic skills which are required in order to prepare Ontarians for a productive economy and a changing society.

▲ 3: Developing an integrated educational spectrum

Study Team 2's research and consultation have revealed that a range of policy initiatives are needed in order to overcome the excessively high costs, to students and other clients of the colleges, that are imposed by the lack of overall academic consistency, flexibility and transferability between academic programs and institutions throughout Ontario's educational spectrum. For the colleges the solutions involve reducing the information and other costs associated with inter-institutional cooperation so as to facilitate credit transfers, improve academic quality, and actively encourage lifelong learning. The time has come to introduce a network which will coordinate resources more effectively and allow for greater collaboration and collective decision making with all of the various stakeholders.

▲ 4: Realizing greater social equity and economic efficiency

Given the extent of qualitative and quantitative demographic change taking place in Ontario, colleges will need to play a major role in realizing the mutually reinforcing aspects of social equity and economic efficiency. Colleges are well placed to encompass both objectives by providing one of the major links between the diverse skills, culture and aspirations of Ontario's population and the equally complex and demanding world of work. This linkage can only be realized if colleges are learner centred in a way which improves the effectiveness of the educational process, as measured by retention rates and academic standards, for a very diverse set of clients. Colleges must continue to be educational innovators in order to take into account each student's unique cultural background, job history, and future prospects.

▲ 5: Delivering education with finite resources

Realizing the combined objectives of customized access and academic excellence within reasonable fiscal limits will mean that colleges, like business, labour and government, must work to increase organizational effectiveness. The colleges as a whole will need to take advantage of the information age, advancements in participatory managerial practice, and representative structures which incorporate the insights and needs of a diverse group of stakeholders. By using the strengths of a networked structure, which allows for more developed coordination than is currently the case, the college system will be able to realize academic excellence and efficiency in ways which enhances decentralized access to advanced skills, teaching methods, and credentials.

Section 3: Policy Recommendations

Given the challenges and strategic choices outlined above, this section provides a series of more specific programmatic policy options. Not all of these recommendations need be adopted together. The intention here is to offer Study Team members and the Steering Committee the choice of a variety of implementation methods for realizing the public policy objectives for the colleges and the college system.

- ▲ 1 Recommend that in the context of the Premier's Council's efforts, the Ontario Government explicitly include the college system as an active participant in the effort to pursue a high wage, high productivity economic strategy.
- ▲ 2 In the context of province-wide undertakings such as the strategies being initiated by the Premier's Council and the calls by many clients of the colleges for academic standards and credit transferability, it is time for a significant increase in collaboration and coordination amongst all 23 colleges. Therefore, Study Team 2 recommends that the colleges establish a collective mechanism, with a fully representational structure, which will be capable of developing, articulating, and implementing a provincial role - as an economic and social partner - for the college system as a whole. (The representational structure should encompass the college community of administration, faculty, support staff, and students, and the community at large with direct involvement by labour, business, and organizations which represent specific student target groups, e.g., immigrants). The capacity to provide system-wide responses and initiatives is a necessary premise if the colleges wish to coordinate resources in an efficient manner and be invited to take on the role, of which they are capable, in provincial efforts at economic and social development. Introducing a provincial college network should complement not compromise both the academic integrity of each college and the local and regional responsibilities of the colleges.
- ▲ 3 Recommend that the Ontario Government recognize and promote the role of college education in an economic strategy which aims to avoid income polarization by engaging in occupational and educational upgrading across all sectors of the economy. By providing skill upgrading and education applicable to all sectors of the economy, colleges can play an important part in

avoiding a situation where the workforce is polarized on the basis of income and skill levels. Government policy should recognize the importance of skill upgrading both within sectors and across sectors as a crucial part of a strategy to actively promote equality and a dynamic, flexible economy.

- ▲ 4 Recommend that the Ontario Government set the mandate of the college system so as to ensure that the *primary* goal is to provide 'generic education' for all students regardless of type or duration of program. A basic definition of generic education encompasses the following components: "... practical life skills essential for both personal and career success ... including language and communications skills, math skills, learning and thinking skills, interpersonal skills, and basic technological literacy. They are not job specific, but are crucial to mastering changing technologies, changing environments and changing jobs. Some generic skills are now taught in discrete courses - communication, mathematics, creativity - while others - critical thinking, problem solving, logic, technological literacy - may be introduced and/or reinforced in courses across the curriculum." (Park) The intent is to ensure that skills training educates students beyond the narrowly defined needs of a particular job and leaves the trainee better able to take on different tasks in the future. This should be the case whether the program lasts two hours or two years.
- ▲ 5 Recommend that "the Ontario Government establish an Office of Applied Research within the Ontario college system. This office would have a number of tasks, including the development of a registry of faculty and staff willing and qualified to carry out research, establishment of an information and assistance program for faculty and staff wishing to gain access to funding for research, administration of a research fund to support a small program of grants for faculty and staff, seeking partners from the business, labour, government and non-profit sectors for collaboration in college-based research activities and development of an applied research agenda for the entire college system." (Borins and Holloway) This proposal is intended to enhance the primary function of the colleges, which is teaching, and does not overlap with the kinds of research properly carried out within the university setting. The main aims of this recommendation are to improve morale and job satisfaction within the colleges and ultimately increase the quality and

relevance of instruction at the colleges as well as contribute to socio-economic innovation and technology diffusion in the college's community and region.

- ▲ 6 Recommend that the Ontario Government establish an Institute for Innovation in Educational Software as a joint venture between the colleges, the software industry, and all of the relevant government ministries. Three important reasons have emerged for this initiative. First, the growing importance of innovation and diffusion of educational software as an instructional tool, especially in a period of increasing demand for education in all areas of life. Second, the need to build upon the existing technical strengths of the colleges, as repositories of teaching expertise, and the software industry, as application innovators, by encouraging cooperative ventures. And third, to help sustain the leading edge characteristics and overall viability of the educational software sector through the development and mass marketing of products. Naturally, careful consideration must be given to ensuring that joint ventures do not generate unfair competition and respect the different objectives of the public and private sectors.
- ▲ 7 In light of the need for major increases in the scope and scale of lifelong learning, it is time for the colleges and the educational system in general to facilitate further initiatives in areas such as credit banking, flexible and efficient methods for establishing credentials, inter- and intra- institutional transferability, and academic consistency. Beginning from the premise of respecting the integrity of all educational institutions, including all 23 colleges, Study Team 2 considers that it is time for the colleges to become a college system for the purposes of planning, assessment and academic credibility.
- ▲ 8 In order to realize the advantages of system-wide academic standards the Ontario Government should direct the colleges to establish a framework for accountable system-wide academic self-governance by establishing a representative body composed of the college academic staff, college administrations, trade unions, employers, community representatives, and the relevant government ministries responsible for education and labour markets.

- ▲ 9 Recommend that the Ontario Government undertake to ensure that the colleges implement a broad based, with strong stakeholder participation, system-wide program of human resource development aimed at ensuring that faculty are prepared to meet the teaching challenges of the future - particularly those of adult education. In addition to the internal programs established within the college system, this effort should take into account the need for exchanges between different sectors of the educational spectrum and between the private and public sectors as well. It is time to facilitate and provide incentives for a sharing of human resources that allows for a greater circulation of educators amongst community organizations, private firms and all components of the public educational spectrum.
- ▲ 10 The simultaneous need to improve academic quality and expand access with success for a more diverse and demanding student body means that the colleges need to introduce a wide variety of customized preparatory strategies founded upon consistent and effective evaluation mechanisms. Therefore, in the interests of access and academic standards, it is time for the Ontario Government to provide direct encouragement for the introduction of a universal and coordinated approach to preparatory and remedial education in the colleges.
- ▲ 11 Recommend that the college system establish provincial academic program planning committees on a sectoral basis with the participation of labour, employers and sectoral associations with the aim of facilitating long-range regionally sensitive planning, province-wide specialization and coordination, quality assurance and innovation, and special labour force adjustment programming.
- ▲ 12 In order to facilitate the process of entry, transfer, and cooperation amongst educational institutions in a way which reduces information costs for students and employers the college system must establish consistent academic standards. These standards should respect the specific needs of local communities and the integrity of the curriculum development as a participatory process led by the academic staff.
- ▲ 13 Recommend that the Ontario Government and the college system collaborate to ensure that funding formulas and academic reward structures offer

systematic incentives for the development and delivery of flexible, modular, non-institutionalized, innovative education.

- ▲ 14 Recommend that the Ontario Government delegate the role of college level credential certification and the associated accreditation, to a representative provincial body which will integrate and pursue the interests of students, employers, workers, faculty, and the community at large in high quality education. Credentials are the means of assigning value to educational achievement. As such, credentials are subject to rigidity, inflation, and unnecessary exclusivity. The public has a right to expect high quality credentials that reflect social needs and values as accurately as possible. By providing a mechanism for balancing the conflicting interests of these different constituencies the government will help to introduce greater flexibility and more accurate valuation of educational experience.
- ▲ 15 Recommend that the Ontario Government, in conjunction with our educational institutions, establish a means for providing college graduates with opportunities for further professional development utilizing teaching methods which combine appropriate amounts of practical and theoretical learning. A number of factors indicate that there is a need to introduce a new range of advanced professional credentials based upon the a college oriented method of instruction that combines practical and theoretical work. Study Team 2 heard requests from employers and employees for opportunities to upgrade credentials beyond the college level but without moving into the preponderantly theoretical realm of the universities. Although the exact fields and institutional configuration require detailed study, it is time to respond to the demand for educational credentials beyond the college graduate level and which combine the resources and expertise of colleges, universities, the community and industry.
- ▲ 16 Study Team 2 recommends that the college system engage in a formalized process of articulation with the schools and universities so as to ensure that every student is better informed about their educational choices and receives appropriate and fair credit for their educational achievements. Developing clearer and less cumbersome linkages between the different components of the educational spectrum is one of the most effective ways for the government to increase both the value of, and open up more avenues to,

educational achievement. This is especially true for young students just beginning to plan their educational future and the many workers who now wish to improve upon their educational achievements.

- ▲ 17 Recommend that the Ontario Government work with the college system to introduce guidelines which facilitate college delivery of fee for service training. These guidelines must clearly distinguish between publicly funded and fee for service activities. The goal is to maintain the integrity of the different functional and financial roles and avoid any conflict of interest which might arise from 'unfair' public subsidies. In particular, it is important to avoid addressing specific training deficiencies by adjusting the goals and standards of public academic institutions. This means that part of the effort to distinguish between fee for service and publicly funded education involves a distinction between economic or industrial policies aimed at assisting specific sectors or firms with labour upgrading and basic educational policy. By respecting these distinctions it will be easier for colleges to expand fee for service training without compromising their public mandate or accountability.
- ▲ 18 Recommend that the colleges establish a provincial 'clearing house' to coordinate, market, and develop 'fee for service' training (perhaps in conjunction with the Ontario Training Corporation) with the aim of both facilitating access to job specific training and initiating new entrepreneurial activities in the training field. This type of partnership endeavour must work within guidelines established for safeguarding the primary educational goal of colleges which, as public institutions, is to provide students in all forms of education and training with generic skills.
- ▲ 19 Given the importance of applied research, joint ventures with private and public sector partners, development and outreach around job specific/cost recovery training, that the colleges introduce institutional mechanisms, such as the college training 'corporations' found in other jurisdictions, which promote and coordinate these activities.
- ▲ 20 In light of the important benefits, such as improved linkages between colleges and the community, which result from cooperative education administered in a way which respects the college's primary academic role, it is time for the

college system and the Ontario Government to initiate a coordinated approach towards encouraging and regulating the application of cooperative educational modes in a wider range of courses and worksites.

- ▲ 21 Recommend that the Ontario Government address the issue of providing better access for the employment disadvantaged who wish to gain new skills at the college level. The implementation of these programs should be jointly administered at the local level by the colleges, employers, trade unions and community groups in order to take into account regional needs, special target populations, and the need for improved coordination.
- ▲ 22 Recommend that the Ontario Government and college system cooperate in the establishment of regional and sectoral education committees with the aim of ensuring appropriate specialized services and accessibility on a regional basis.
- ▲ 23 Recommend that the college system attempt to reduce unwarranted duplication, provide mechanisms for enhanced accessibility to a wider range of courses, credentials and programs within a framework that streamlines managerial hierarchies, introduces system-wide integrated information systems, fosters academic specialization where there is a clear local and/or provincial need, and aims to provide flexible, low overhead education.
- ▲ 24 In order to address the need for greater investment by Ontarians in workplace training, Study Team 2 recommends that a joint government, labour, business and college task force be established to examine various incentives and potential funding options.
- ▲ 25 Applied research and professional activity with industry, the social service sector, government, and community organizations plays a vital role in keeping the skills and knowledge of college faculty current. Study Team 2 recommends that the government take steps to encourage these activities through such methods as donations of up-to-date equipment and staff exchanges with all sectors.

Section 4: Summary of the Research

The Study Team commissioned five research papers on issues which emerged from our discussions of the premises and challenges facing the colleges. Generally the research was intended to respond to a number of basic questions. First, what role if any did Ontario's colleges have with respect to efforts to realize an economic and social well-being? Second, what exactly are the skill requirements of today's economy? Third, do colleges have a particular role to play in the process of technological change and the diffusion of new technology? The fourth and final topic called for an examination of the relationship, or trade-offs if any, between social equity and economic efficiency.

The Executive Summaries of all five articles are provided below. The original articles are available from the Council of Regents. *Please note that these papers are the work of independent researchers and the opinions expressed do not necessarily represent the views of the Study Team members.*

▲ **Rianne Mahon**

***Toward a Highly Qualified Workforce:
Improving the Terms of the Equity-Efficiency Trade-Off***

That the Canada-U.S. free trade agreement will accelerate the restructuring of the Ontario and Canadian economies is not in dispute. There is, however, rather less agreement as to the kind of restructuring that should be encouraged and the kinds of policies required. In this paper it is argued that the current debate on restructuring constitutes a 'window of opportunity' for the Province, a chance to develop policies designed to improve the terms of the equity-efficiency trade-off by developing a highly qualified workforce. Although Vision 2000's mandate is to re-think the role of Ontario's community colleges, the recommendations it makes will have a far-reaching effect. The community colleges can be reorganised to fit into the 'hour glass' society that is emerging to the south. This seems to be the direction currently favoured by federal policy. Alternatively, they can be structured to supply the workforce with the kind of skills required to revitalise the goods-producing sector and to promote the development of a high quality, dynamic service sector capable of paying good wages.

The first section of the paper surveys developments in the goods-producing sector and concludes by supporting the basic thrust of the Premier's Council's report,

Competing in the New Global Economy. The second section takes a more careful look at the service sector, arguing that if the community colleges are permitted to expand their programmes for training para-professional workers, they can make an important contribution to the development of a dynamic, high wage service sector. The third section critically examines the current federal training initiatives while the last section tries to spell out the basic principles that should inform Vision 2000.

▲ **David Wolfe**

New Technology and Education: A Challenge for the Colleges

The economies of the industrial countries are undergoing a period of profound economic adjustment. Patterns of industrial production, international economic relations and the consensus over accepted approaches to economic policy are all in a state of flux. This period of economic change is also characterized by an anomalous combination of persistent unemployment and critical skill shortages in a range of occupations.

The present period of economic dislocation involves a process of invention and experimentation in the search for new technologies and new forms of production and distribution. Although technological innovation is a regular feature of industrial economies, the magnitude of the current dislocation results from the pervasiveness of the innovation underway. Shifts of this magnitude have occurred only three or four times previously in the history of the industrial economies.

Some observers have characterized the changes we are currently experiencing as a new technological revolution or the emergence of a new techno-economic paradigm. What distinguishes a technological revolution from lower orders of technological change is the specific set of characteristics associated with its most important input, or key factor. The key factor is characterized by a low and rapidly falling relative cost curve; a virtually unlimited source of supply over long periods of time; and an obvious potential for its use or adoption as a factor in a wide range of products and processes throughout many branches of the economy. A recent investigation conducted for the OECD by a group of experts concluded that there is only one set of technologies today that meets these criteria for the key factor in a new technological revolution: microelectronic-based information technologies.

The emergence of a new techno-economic paradigm requires a corresponding shift in a range of other social and political institutions to facilitate the effective diffusion

and adoption of the new technologies. Of critical significance for the present investigation is the availability of a labour force with the appropriate mix of skills and occupations. The implications of the new techno-economic paradigm may call for an adjustment of the skill profile at all levels of the workforce. On balance, the trends associated with the managerial common sense of the new paradigm are towards higher and broader levels of skill and for greater flexibility in the way that skills are deployed in the labour process. The overall emphasis is on flexibility in the use of new technology across all sectors of the economy. The need for greater flexibility arises from the quantum increase in the computer-mediated nature of work. The spread of information technologies requires individuals in a wide range of jobs to accomplish their work through the medium of an information system, rather than through direct contact with the object of the task.

The growing interposition of information systems between operators and their work process means that their relationship with that work process becomes far more abstract and formalized. Workers in such a cybernated system require skills which are defined as a general ability to understand how a system functions and to think flexibly in trying to solve problems.

The rapid pace of change associated with the new techno-economic paradigm make it unlikely that the skills acquired by students in their primary or secondary education will remain adequate throughout the entire course of their working careers. Workers must be prepared to adjust their skill levels and acquire related skills on an on-going basis. Post-secondary institutions, particularly the college system, will face a challenge in deciding what kinds of training to provide for which categories of labour market entrants or members of the active workforce.

In light of the considerable uncertainty about future requirements for specific skills and the increasing importance of workplace centred learning, there is a growing consensus that the educational system should place greater emphasis on the transmission of fundamental skills. The concept of fundamental skills can be construed as having four dimensions:

- analytical problem solving skills;
- functional literacy;
- technological literacy; and
- interpersonal and communications skills.

The challenge for the colleges is to structure these components of fundamental skills into every aspect of their curriculum programming. The range of fundamental skills required by the technologically literate workers of the new paradigm cannot be taught as a discrete component of an increasingly specialized curriculum. Rather, they involve fundamental and generic skills that should form the basis of every other aspect of the curriculum. The colleges will also need to customize their learning packages to meet the diverse needs of a wide range of client groups. In effect, they will need to adopt the same principles for the flexible provision of education that constitute the best practice frontier of management in the new techno-economic paradigm.

▲ **Peter Warrian**

***Industrial Restructuring, Occupational Shifts and Skills:
The Steel and Electronic Manufacturing Cases***

Recent changes in skill requirements and occupational composition in the steel and electronic manufacturing industries may be considered representative of future skills development in Ontario's industrial economy. These will set the framework for the training requirements in the economy of the 1990s. Ontario's Community College system will be challenged to re-consider its structure of delivery, emphasis and methods of teaching in order to meet them.

Restructuring driven by international market forces or technology as an opaque, if not invisible hand, cannot be assumed to produce the value-added restructuring necessary for the Ontario economy to sustain the social environment the Premier's Council has endorsed. Active labour market and training policies will be vitally necessary if the goal of enhanced value-added production in Ontario is to be realized. It is within these broad international economic and technological forces that the Community College system can contribute to positively enhancing value-added production by helping provide an adequately and currently skilled work force to drive the economy of the future.

As this paper points out, the analysis of the dislocated worker labour market problem has established that internal and external labour market issues cannot be separated. They are but aspects of the same issue. This means in turn that the upside and the downside labour market adjustment issues are also the same. The re-skilling or up-skilling of the work force is necessary to both the realization of the an enhanced value-added goods producing sector for the Ontario economy and to

ease the negative impacts on workers of industrial restructuring. In addition, the colleges have an important proactive role to play in altering the training culture by supplying education and initiating occupational/credential changes which diversify the internal labour market in a way that enhances value added.

There have been important occupational shifts taking place in recent years in both the steel and the electronic manufacturing industries. In both cases, 'knowledge intensive' occupations tend to gain, while 'labour-intensive' occupations have been losers in both industries. Within the production workforces, the traditional electro-mechanical skills have been in decline while electronic and information-related skills have been in the ascendancy.

The following general conclusions are supported by the results of field interviews.

1. The first task is to equip the current and future workforce with a solid base in the fundamental skills of literacy, numeracy, communications and problem solving.
2. The Colleges in their technology and other vocational training activities should concentrate on giving a good grounding in applied generic skills. The application and firm-specific training should be left to individual firms.
3. Colleges may co-operate in delivering short-burst, customized training in co-operation with local industry for both general upgrading and specific applications.
4. In spite of the general patterns of upskilling, industrial restructuring will also have a labour adjustment downside affecting specific localities, occupations and industries. The role of the College in these cases should be the enhancement of the portable fundamental skills and generic applied skills that these workers will need to be re-employed.

▲ **Sandford Borins and Shirley Holloway**

Meeting the Competitive Challenge:

Enhancing Applied Research In Ontario's Colleges

It has become increasingly obvious that governments throughout the world must rethink their economic policies in order to compete successfully in the new global economy because the rapid development of information and communications technology has transformed the marketplace. The key factors in a successful economy are the abilities to develop new technology and to apply it to create new products and processes. This requires a high level of research and development, a

literate, well-educated workforce and increased cooperative initiatives between government, business and labour. This paper examines some aspects of the role which community colleges can play in the creation of a Canadian society able to maintain a high standard of living in the competitive global economy. More specifically, it argues that applied research should be a part of the community colleges' mandate. The two major reasons are that this would improve the pedagogical capabilities of the colleges and that it would enable the colleges to contribute their expertise in responding to the need to improve Canada's performance in research and development.

The focus group discussions carried out by the Vision 2000 Study Team 2 made it clear that business interests are concerned that faculty members remain current in their fields so that students will receive appropriate, leading edge instruction. The general consensus is that active participation in research and development would support the quality of the institution's teaching.

The concept of carrying out applied research in the colleges is not new and an examination of initiatives already undertaken shows that there is a proven record of success. Most of the instances cited exemplify a high degree of cooperation between colleges and businesses or other agencies and or consortia which ally universities with colleges and business. A wide range of interests are covered by these partnerships and they are most often built on the foundation of local economic interests and the expertise of staff members in the educational institution. The outcomes of such applied research have ranged through the development of new products or processes, resulting in increased local employment opportunities, new delivery methods for established curricula, introduction of leading edge technology into the curriculum, establishment of new businesses and help to existing companies in adjusting the capabilities of its labour force to meet new demands. Some applied research undertaken by colleges has aided the entry of non-traditional students into the formal educational setting and one case is cited of work which has led to improved educational possibilities for the disabled.

An examination of a recent survey of faculty members at Ontario colleges by Stephen Bell shows that many faculty in community colleges are already engaged in some form of applied research, and it is clear that there is an appetite to continue to expand this interest.

Although community college faculty are constrained to some extent by the limitations of their contracts and also by funding availability, the authors present recommendations that would enable research to be carried out within the current system on a cost-effective basis. Central to these recommendations is the establishment of an Office of Applied Research within the Ontario College System. This office would have a number of tasks, including the development of a registry of faculty and staff willing and qualified to carry out research, establishment of an information and assistance program for faculty and staff wishing to gain access to funding for research, administration of a research fund to support a small program of grants for faculty and staff, seeking partners from the business, labour, government and non-profit sectors for collaboration in college-based research activities and development of an applied research agenda for the entire college system.

The proposals do not detract from the primary function of the colleges, which is teaching, and do not overlap with the kinds of research properly carried out within the university setting. They do provide support for applied research because it will improve morale and job satisfaction within the colleges and ultimately increase the quality and relevance of instruction at the colleges as well as provide social economic benefits to the community.

▲ Pat Armstrong and Hugh Armstrong
Choosing Equity and Prosperity:
Access to College and the Ontario Economy

Almost all who are disadvantaged by reason of class, sex, race and ethnicity, language, age, geographical location, or physical capacity, or just plain luck, have the legitimate desire to better their situations and the situations of individuals in their households and other groups. This desire, it is argued, is consistent with the requirements of a rapidly changing formal economy and of its rapidly changing relations with the domestic and volunteer sectors where production also takes place. There exists a happy coincidence between our democratic equality and economic efficiency impulses.

The accelerating pace of economic change and the strategic choice to favour high-value-added, high-wage labour force activity demand workers who can learn rapidly and who have high skill levels. These demands in turn require increased access to education, much of which the colleges are well placed to provide. They are widely

dispersed across the province, and are particularly attuned to the communities they serve and to the employment needs of Ontario society.

Although the colleges have contributed substantially during their 20-odd years in existence to making postsecondary education more accessible, much remains to be done to tap the potential of individuals from all segments of Ontario society as we prepare for the economic challenges of the next century. Simply put, we cannot afford to waste that potential.

The core section of this paper addresses the issues affecting labour force supply. More specifically, it focuses on the barriers to equal access that still confront disabled persons, older workers, women, the poor, and members of diverse racial and cultural groups, including Native Peoples and first-generation immigrants.

Other sections of the paper sketch recent trends in the characteristics of the college student population, factors affecting the demand for labour, and aspects of the public policy context that particularly influence the supply of and demand for labour. Acknowledging the contributions that employer-based training and short courses and counselling from community-based agencies can and must make, the paper argues that on the mutually-reinforcing grounds of equity and efficiency the colleges have a central contribution to make in the provision of general education, generic skills and high-level career-oriented programs to a broader range of Ontarians.

Section 5: Summary of the Consultations

Vision 2000 is predicated on consultation. The consultative task was divided up according to the issues and constituencies relevant to the study team. This approach was adopted in order to make sure that the consultations were both representative and conducted in a manner which best suits the constituencies being consulted. Study Team 2 undertook a consultation process with selected employer and employee representatives from across Ontario, to seek their views on the economic role of the community colleges.

Common points arose in each of the 12 'focus groups,' and other points were raised frequently or emphasized strongly.

▲ 1. General Comments

- The changing economy requires more highly qualified workers
- The work force is not well enough educated and trained
- Therefore, there are occupationally and regionally specific shortages of skilled labour
- Positive attitudes towards lifelong learning are needed
- Mobility in the workforce and flexibility in education and training are needed
- A coordinated approach among educational institutions, governments, employers, and employees is recommended to solve these problems.

▲ 2. Common Themes

The degree of commonality on the key issues was extensive and indicated the following three common themes:

a) Generic skills

- Every group strongly expressed the need for better general education and skills training — termed 'generic skills'
- These skills include written and oral language skills, numeracy skills, general technical skills; as well as the ability to think, to learn, to analyse and problem-solve; and interpersonal skills
- The publicly-funded colleges should be responsible for teaching these portable skills

- Employers should take responsibility for job-specific training -- which could be provided by colleges, but funded by employers
- It is essential that workers have the ability to be trained and retrained.

b) College-wide 'system'

The need for a college-wide coordinated system was identified in order to respond to issues consistently across the province. Some of those identified were:

- Common standards to assist employers in recruiting are needed
- Common credentials are needed for the same reason, and to give value to students' knowledge
- Greater transferability of credits, both between universities and colleges and between individual colleges
- Improvement of opportunities for disadvantaged groups, for which the colleges have a social responsibility
- Upgrading/retraining/teaching adults requires some different approaches in teaching and flexibility in courses
- Cooperative work/study programs, carefully managed, are encouraged
- Planning of educational needs with various business sectors.

c) Public Education

- There is strong support for the colleges to remain as public institutions
- Employers say they have to take more responsibility for training but want to work closely with the colleges
- Trade unions and community groups say that education should be 'learner-driven'

▲ 3. Other Issues

Several other issues were raised frequently, often with emphasis:

- College teachers need more workplace experience
- Confusion between federal and provincial jurisdictions needs to be sorted out
- Employers would like the rigidity between colleges and universities broken down; the unions like the colleges as distinct institutions
- Accessibility must be improved through, e.g., better financial support, services, attention to special needs
- The image of blue collar work should be improved and the colleges can help

- Employers and employees are eager to consult on program and course development
- Francophones have special needs, including measures to encourage higher participation rates in postsecondary education
- Northerners have special needs, mostly arising from a different population mix and the vast distances of the North
- Trade unions and community groups believe the needs of students for portable skills and reduced barriers should take precedence over job-specific needs of employers
- Applied research which is mutually beneficial to the colleges and economic growth should be looked at.

Section 6: Concluding Observations

Study Team 2 recommends that the Steering Committee initiate a round of informal consultations with major educational constituencies in order to inform them of the emerging results of Vision 2000 and solicit their suggestions for amendments or additions.

Study Team 2 urges the Steering Committee to call upon the Federal and Provincial governments to undertake a national assessment of education, with the aim of providing a more integrated and effective national educational infrastructure.

Appendix 1: Members of Study Team 2

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Appendix 2: Chronicle of Events for Study Team 2

▲ Meeting dates:

- January 25th, 1989.
- February 16th, 1989.
- March 29th, 1989.
- July 11th, 1989.
- September 13th, 1989.

▲ Study Team 2 Consultations:

Sector	Date	Location
1. Manufacturing	May 17	General Motors, Oshawa
2. Public and non-profit	May 26	University of Toronto, Toronto
3. Industry	June 6	General Motors, London
4. Information	June 16	Centennial College, Toronto
5. Associations	June 20	Humber College, Toronto
6. Social planning agencies	June 22	Social Planning Council, Toronto
7. Trade unions	June 26	Ontario Federation of Labour, Toronto
8. Financial	June 26	Ryerson Polytechnic, Toronto
9. Hospitality	June 28	George Brown College, Toronto
10. Construction trades employers	June 29	Algonquin College, Ottawa
11. Francophones	June 29	Algonquin College, Ottawa
12. North and resources	July 4	Timmins